

ARCHITECTURE

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THE SOCIETY OF BEAUX-ARTS ARCHITECTS

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ARCHITECTURAL CRITICISM.

ONE of the first impressions of the casual observer upon seeing the Hoboken Terminal of the Lackawanna Railroad (Kenneth M. Murchison, architect), is that it closely resembles a great sardine box. It is without doubt

one of the tinniest things in the harbor. It is so tinny that one expects to hear it rattle all the time. And it sometimes does.

The architect, however, did not employ a metal covering for the concrete beneath as a matter of choice, but did so for the reason that the building might sink from time to time (not entirely, but merely a foot or so) and the metal covering was designed to cover up any cracks which might occur in the structure proper. Although some months were spent in evolving a style of decoration suitable to copper-



work, the company endeavors to keep the slips full of ferry-boats so that the copperwork is seldom seen.

When the question of a tower was raised with the Board of Directors of the Company, they did not seem to be able to figure out exactly just how much increased dividends a tower would bring forth, but finally the architect was allowed to stick a neat tin tower on top of the structure. Many of his kind friends among the architects wondered, as long as he had stuck one there, why he did not stick on a bigger one.

The interior of the station defies description. Every size and shape of room is found within, but perhaps this is on account of the architect not having been able to discover a right angle in the property when he started work on the plans. The smallest room is four feet by six feet, and the largest is seventy feet by five hundred feet. This latter, which is a concourse leading to the second deck of the ferry-boats, is so much larger than it ought to be that it has been seriously proposed to rent it out evenings as a stamping ground for the Hoboken militia. The commuters on their side have proposed giving a great commuters' ball in this space.

The above comment has been written in a frank, fearless spirit with the purpose of warding off any other criticisms which might be hurled at the building by its architectural friends.

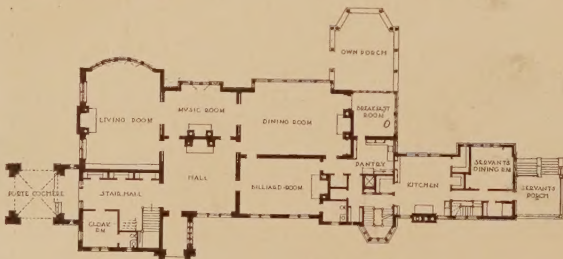
KENNETH M. MURCHISON.

THE architect, like every one else, is a slave to tradition. He often forgets practical needs in his eagerness to produce an effect. In his travels he sees a stately structure or a charming country house and feels the inspiration to produce a similar effect and in turn immortalize himself. Thus we find in our great American cities, bits of architecture that remind us of buildings we have seen in the old Italian and French cities; then, too, in our suburbs we find familiar architectural forms which recall the delightful hours spent in the quaint towns of England. But, after all "There is nothing new under the sun" and if we produce an English house in America on lines of traditional domestic

architecture of that country, can it be called a fault. We offer this as one of the criticisms of the Edw. C. Hoyt residence, Stamford, Conn. (Newman & Harris, architects), which we are asked to judge.



Technically there is an unmistakable defect in the plan which directly influences the roofing of the building. It will be seen that the house is too thick through to be logically roofed, in a word, the roof if given proper pitch to shed the snow would be excessive in height and entirely out of proportion to a two-story dwelling. To overcome this defect, the roof has been made to spring correctly from the eaves on the side shown in the illustration, but to prevent an abnormally high roof, the ridge line is drawn toward the front and the flat slope from the ridge on the opposite side is masked by triple dormers which save what otherwise would have been a hopeless elevation. The fault is not evident from the ground level, in fact, a bird's eye view of the roof itself would be necessary to reveal the extent of this defect. In justice to the architects it must be added that, despite its low pitch, the roof does not leak. The cause of the trouble lay in the desire to dispose rooms about a hall so that none should be traversed to reach another, a prejudice which must ultimately give way, like that of a separate hallway from kitchen to front door, to economical and good planning.



A further study of the plan discloses another "intentional mistake" seen in the wing to the right, devoted to the housing of the servants, which from an aesthetic point of view only, is too small. Exterially the lines of the house would be more pleasing if this wing had been extended a few feet as was contemplated in the original study. Then the relation of window area to the too little wall space in the long elevation facing the woods comes under the same head. But this is perhaps, excusable, when we take into account the fact that the rooms are deep and also that this is the view side facing the Sound.

We should be able to contrast the two long elevations

to show that the quaint half-timber Chester English architecture, successful to a degree in the garden side of the house, is nearly altogether absent in the main façade. This does not apply altogether to the ends, except in the porte cochere, which until age and the clinging clusters of ivy soften its hard lines, will seem an appendage rather than an integral part of the whole.

There are undoubtedly other features open to criticism and were the author not the architect he would find reason for making this a lengthier criticism. But it is fair to hope that the careful study and efforts made in good faith to meet honestly the requirements laid down deserve a word of commendation.

F. E. NEWMAN.

THE type of the new building belonging to the State Bank of Hartford (Benjamin Wistar Morris, architect), and recently occupied by them was determined upon only after mature consideration. The Directors and Building Committee were somewhat divided in opinion as to whether a high office building should be erected or a structure for the exclusive use of the bank.

The site is an inside lot, about forty-one feet wide by one hundred feet deep, and is directly opposite the old State House, now the City Hall and designed by Bullfinch. Adjoining the bank on north and south are the Phoenix Bank Building and the Connecticut Mutual Life Insurance Co.'s Building, respectively five and eight stories high, the Phoenix Bank façade being a flat surface with simple openings and Greek ornament, surmounted by a pseudo-Doric cornice. The Connecticut Mutual Building is possibly reminiscent of the New York Post Office, surmounted by an addition of two stories.



It will be seen that the usual problem was there. The miscellaneous or perhaps even incongruous, if scale and style be both considered to be handled in such a way as at least not to increase these undesirable features, and if possible to ameliorate the situation.

The decision of the owners to build for their exclusive occupancy made it impossible to build to the height of either neighbor. The scale of the lower was better than that of the higher building, so it was considered throughout so far as possible. While the material on either side is granite from different quarries and the State Bank is of limestone, the color effect is harmonious and even uniform.

The owners having abandoned the idea of a high building naturally desired some recompense in distinction, or featuring for legitimate advertising purposes, and this end was sought by the use of one of the generally approved means, namely, large simple wall surfaces terminating the composition with a central motif where all the interest and ornament are centred.

These words appear to be an apology or justification rather than a criticism which was the editors' request, so enough of excuse making. The criticism need not I believe

be entirely my own, so I will state that the inhabitants of Hartford appeared much worried after the level of the key stone was reached and course after course was laid with no more openings and no evidence of termination. I must confess to a little worry myself at times, and to a feeling of relief when the top course of the attic was laid.

The cornice might be improved by the omission of one bracket and respacing so that the outside faces of the extreme brackets would line with the ends of the frieze, thus eliminating a rather clumsy expression at the ends of the cornice.

The keystone projects too far, though this may not be evident in the photograph.

There is not enough masonry in the pedestals beneath the side piers, but on the other hand more light in the rooms inside would not be unwelcome.

Any one who expects to find a large high vaulted room directly back of the central window is doomed to disappointment. The Directors' Room is there, rather long and narrow, English in type rather than French, as one might expect from the treatment of the façade. The furniture in this room is from the old building. On penetrating further, however, justification for the façade will, I think, be found. The Banking Room itself is high, and barrel vaulted and struck from the same center as the exterior arch, so the promise is not unfulfilled.

Further interest could well be obtained by recessing the wall surfaces at the sides of the piers, or even by heavier picking of these surfaces.

BENJAMIN WISTAR MORRIS.

A CRITICISM of one's own work should be honest, but on the one hand it is apt to be somewhat biased and on the other there are likely to be some points where the relations of client and architect prevent as complete an explanation as might be desired.



With the above in mind we would say, as regards the German-American Insurance Building (Hill & Stout, architects), that the dimensions of the lot were unusual and awkward and that the narrowness—even at the widest point—made it necessary to use a vertical treatment rather than a horizontal. We desired to give emphasis and strength to these vertical divisions, and the effect would have been better had the windows and panels been set back eight or more inches deeper, but the ques-

tion of the greatest amount of available floor space was a vital one, and doing this would have meant the loss of thousands of dollars of rentable floor space each year and there would not have been a proper return on the investment.

In the case of the three-story base there also would have been a better effect had the columns been larger, both as regards diameter and height, and more masonry wall surface shown. This again meant too serious a loss of light and floor space. We think that the use of the columns with the bay that we resorted to partly makes up for this by means

of the strong shadows cast and the resulting strength and emphasis given to this part.

The particular feature of this building, namely, the omission of any form of cornice and the use of penetrated vaulting in its place, is, we believe, a distinct departure as related to high buildings. The idea that a cornice, whether Classic, Gothic or any other style, can be exaggerated or enlarged to such a degree as to be discernible hundreds of feet above the ground, appears to us entirely wrong and is far from the solution of the problem of treatments of these high buildings. We believe that this is an important part of the problem over which we are all working. Bearing this in mind we omitted practically all detail and used masses instead. The color being not only a matter of decoration but also an important factor in emphasizing and marking these architectural divisions.

FRED'K. P. HILL.

NATIONAL FINE ARTS COUNCIL.

THE action of the President of the United States, as indicated in his reply to the letter of a Committee of the American Institute of Architects, following immediately upon the presentation of a comprehensive report to the Institute at its annual convention in Washington, is the first definite step toward the establishment of a Bureau of Fine Arts, and marks an epoch in the conduct of governmental work.

It is due to Mr. Breck Trowbridge, the chairman of that committee and the author of the report, to say that this significant and important action is the direct result of his energetic and persistent efforts during the last four years. During this time he has represented in this matter not only the American Institute of Architects, but the Fine Arts Federation of New York, the New York Chapter of the Institute of Architects, and the Society of Beaux Art Architects.

Following the suggestion of the President, the Committee of the American Institute will proceed at once to frame a bill for presentation to Congress, to give permanent effect to what the President has now initiated by an executive order. With the extraordinary success of the Art Commission of New York City as an encouraging example, and with this governmental action as a precedent, it is to be hoped that a similar movement will be begun to guard the artistic interests of the State of New York by the establishment of a similar commission as a part of the State machinery.

The Council is composed as follows:

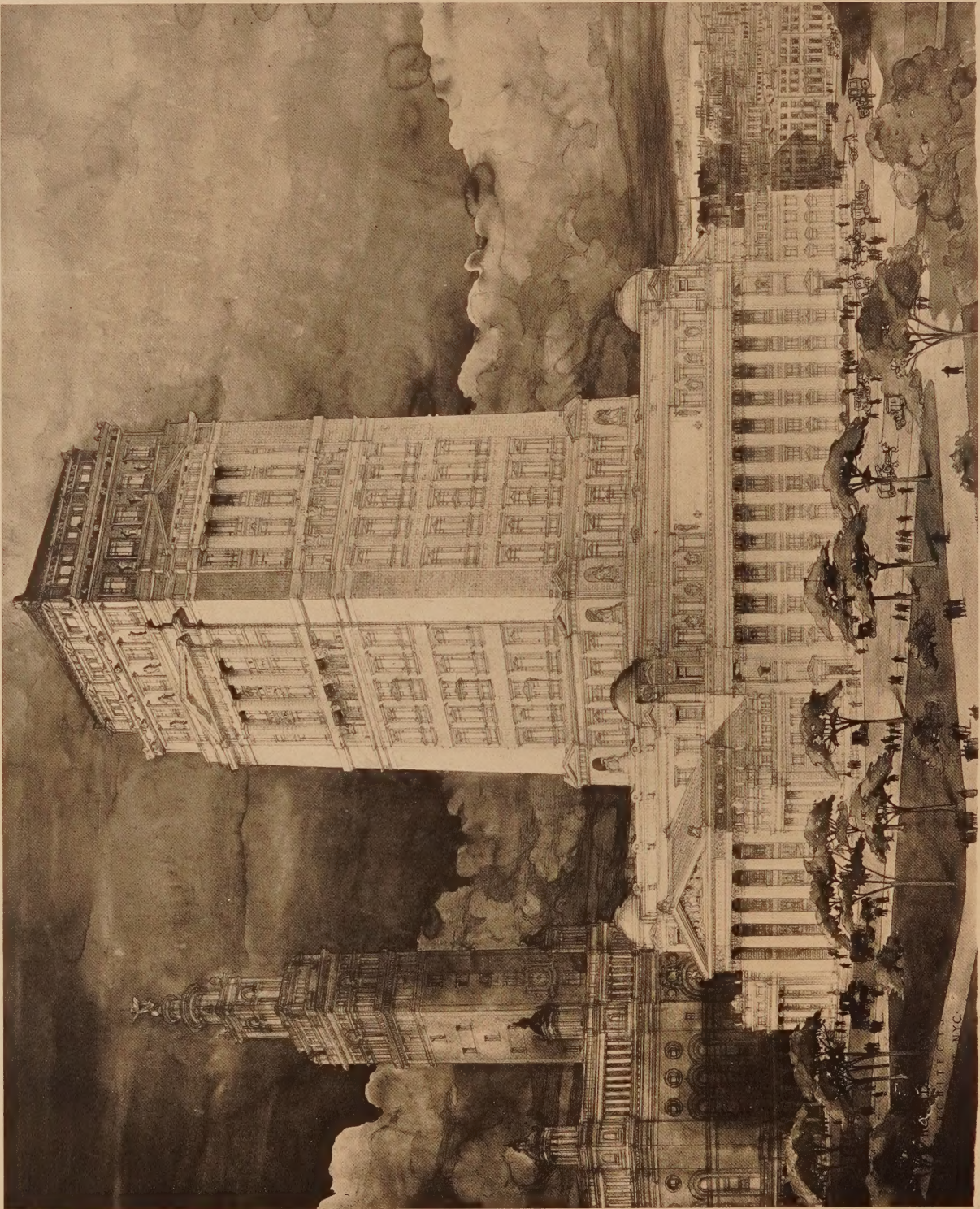
Architects—Cass Gilbert, C. Grant La Farge, Walter Cook, Wm. A. Boring, S. B. P. Trowbridge, J. G. Howard, Glenn Brown, Thomas R. Kimball, John L. Mauran, D. H. Eurnham, John H. M. Donaldson, George B. Post, Arnold W. Brunner, Robert S. Peabody, Charles F. McKim, William S. Kemes, James Rush Marshall, Abram Garfield, Frank Miles Day, William B. Mundie, and C. Howard Walker.

Painters—John La Farge, F. D. Millet, E. H. Blashfield, and Kenyon Cox.

Sculptors—Daniel C. French, Herbert Adams, H. A. MacNeil, and K. T. Bitter.

Landscape Architect—Frederick Law Olmsted, Jr.

The Supervising Architect of the Treasury is to act as executive officer for carrying out the recommendations of the Council.



Howells & Stokes, Architects.

STUDY FOR THE NEW COURT HOUSE ON A SINGLE BLOCK SITE, NEW YORK.

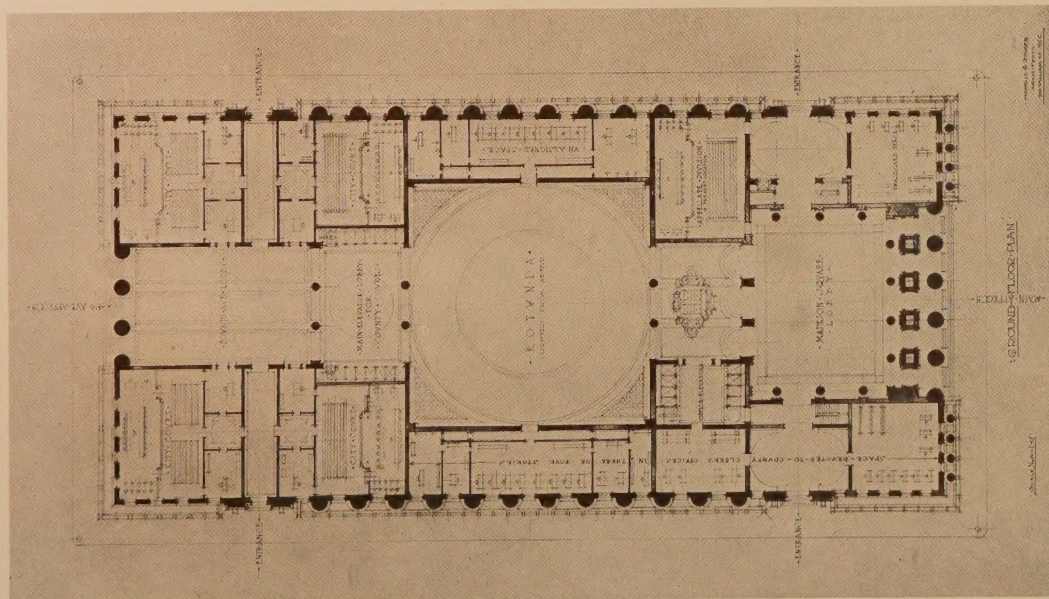
STUDY FOR THE NEW COURT HOUSE ON A SINGLE BLOCK SITE.

THESE studies, made about a year ago, are based on the requirements as contained in the Report of the Court House Board to the Board of Estimate and Apportionment, dated January 3rd, 1907, and show the possibilities of a single block site.

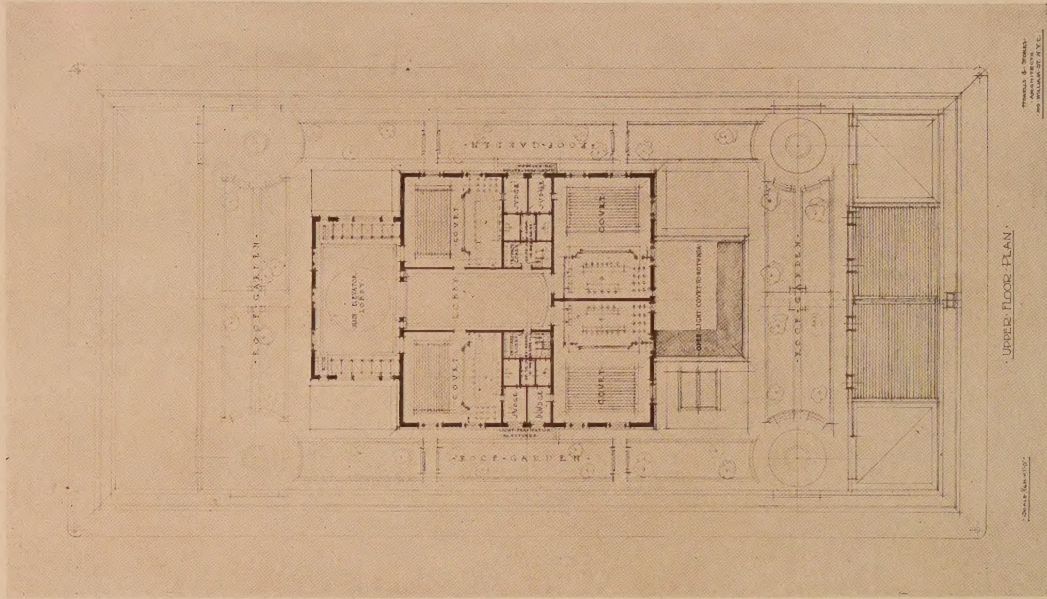
For its development the block bounded by Madison Square, Fourth Avenue, 25th and 26th Streets was selected, as there seemed to be some reasons for combining the new Court House with the present Appellate Division, but other blocks would be as suitable.

The design shows the court rooms collected into a central pilon, or tower, and so placed as to secure greater remoteness from street noises than would be possible in a three or four story building.

The objections which have been raised in the public press to Washington Square as the site of the new Court House have suggested the publication of these studies at this time.



PLANS FOR THE NEW COURT HOUSE ON A SINGLE BLOCK SITE.

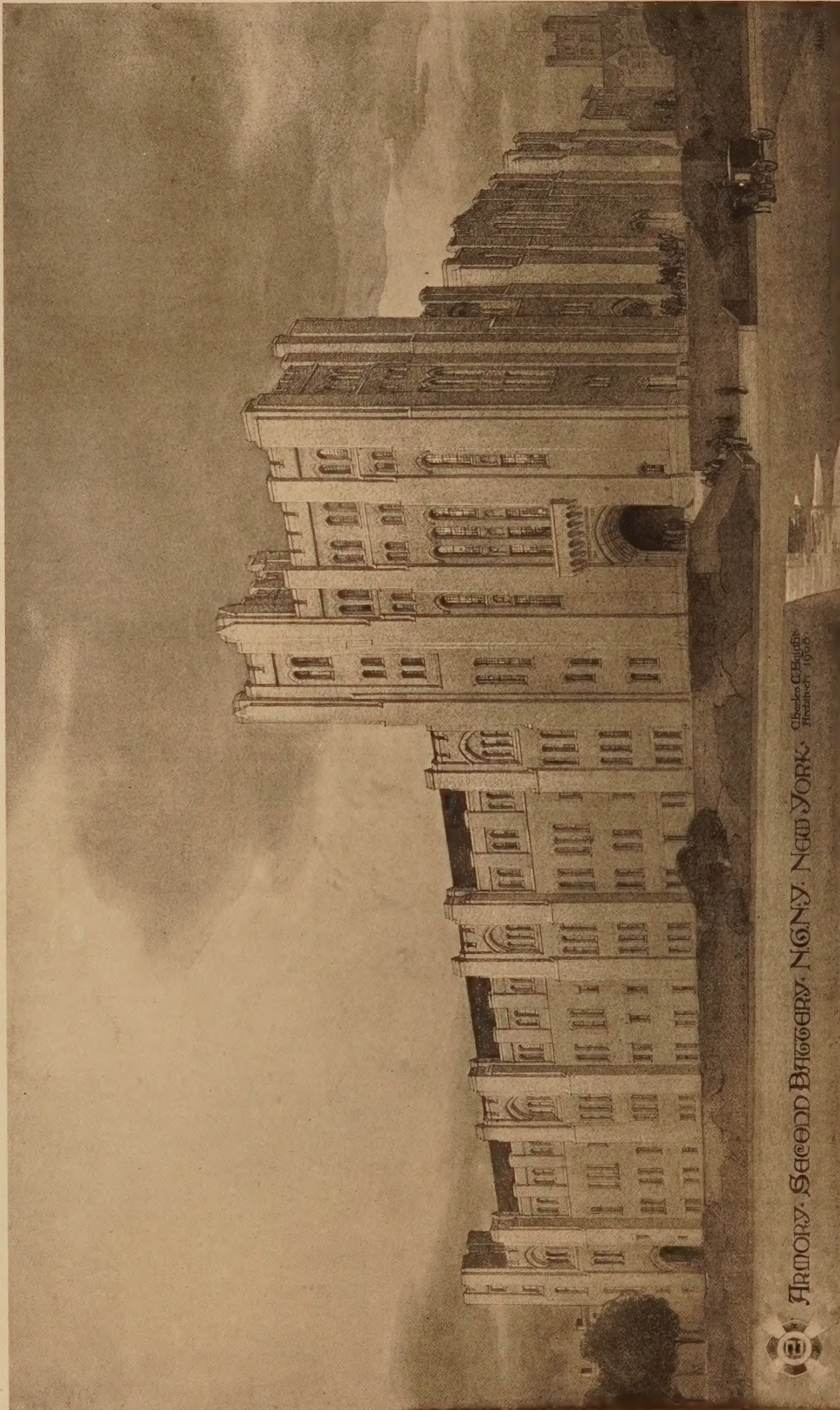


Howells & Stokes, Architects.



MAIN HALL AND DINING ROOM, COUNTRY HOUSE, C. P. SEARLE, IPSWICH, MASS.

Kilham & Hopkins, Architects.



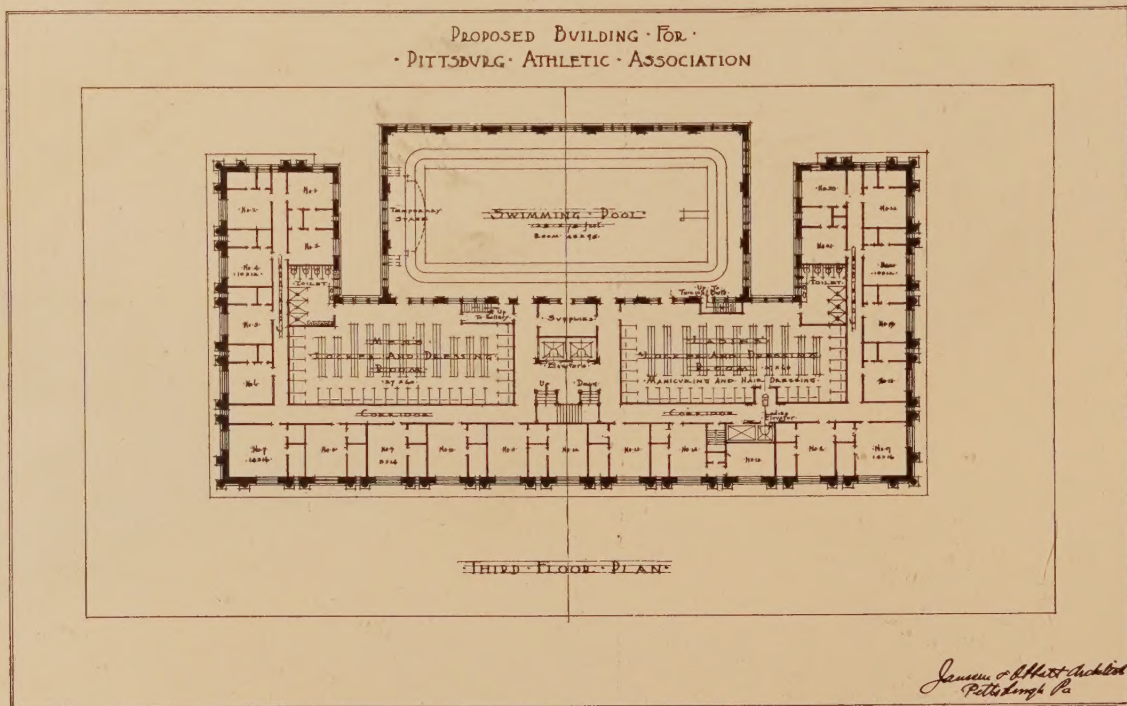
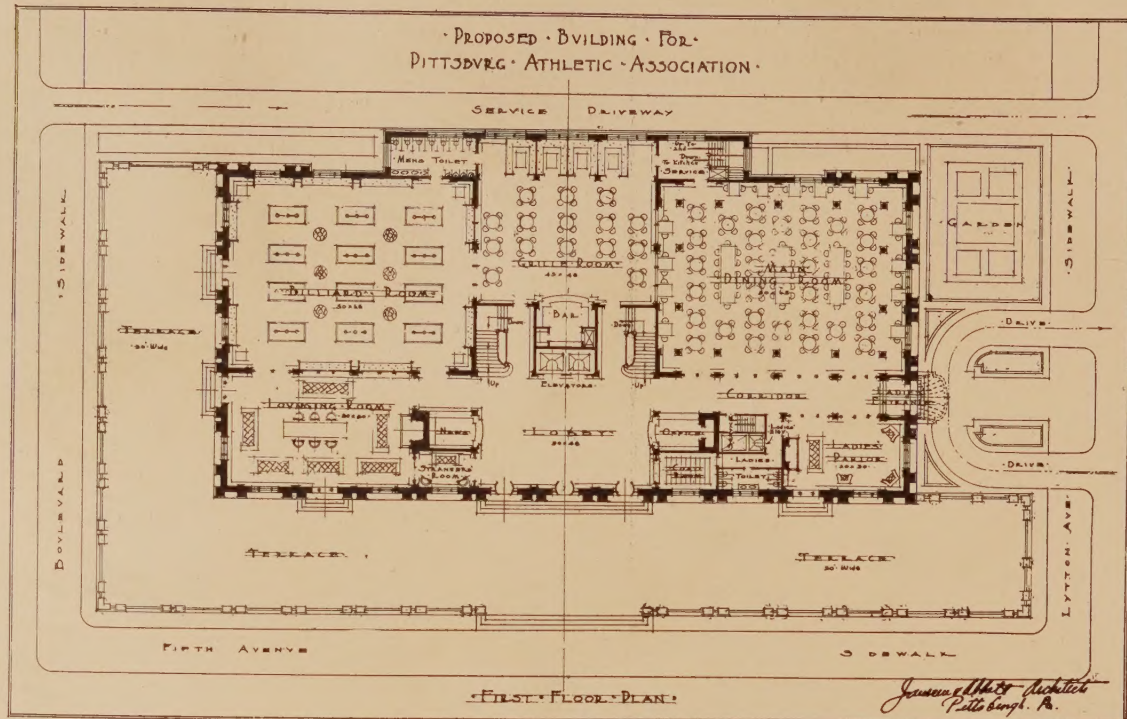
ACCEPTED COMPETITIVE DESIGN, SECOND BATTERY ARMORY, NEW YORK.

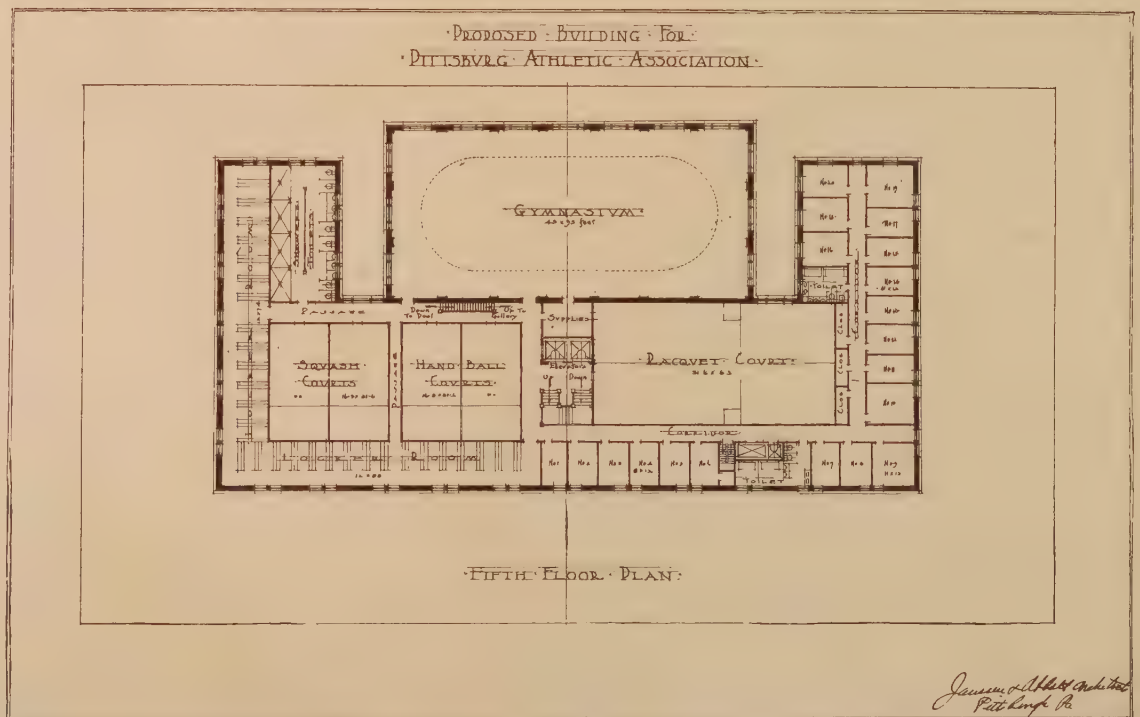
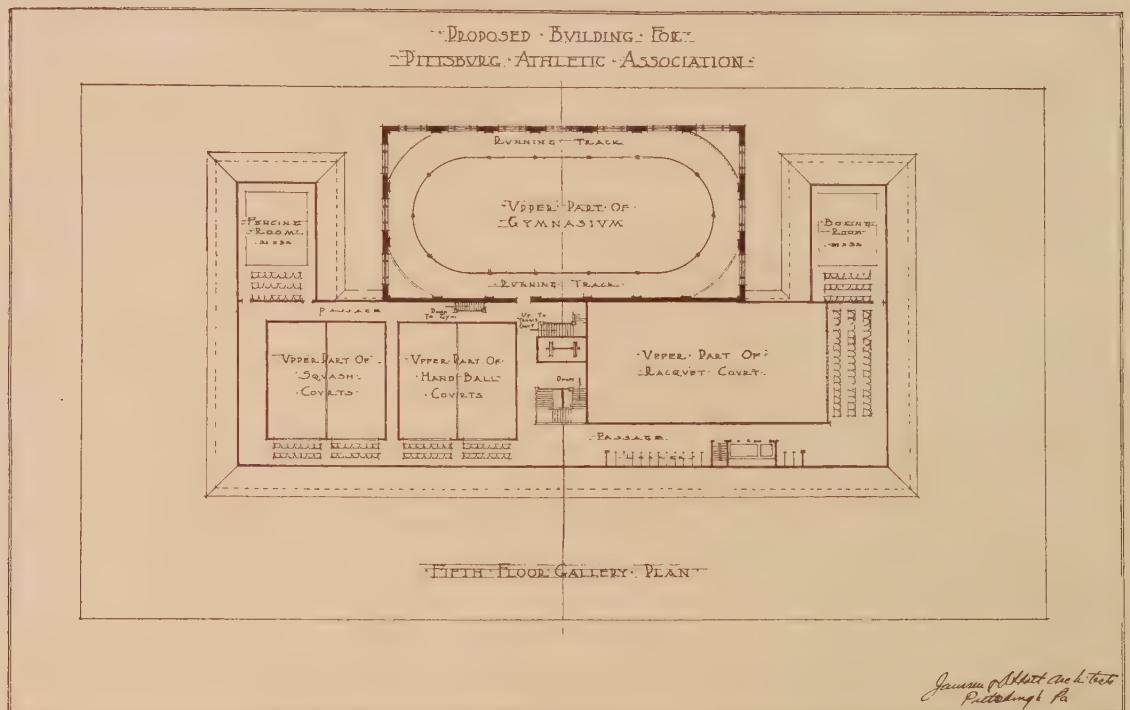
C. C. Haight, Architect.



PETER STUYVESANT APARTMENTS, RIVERSIDE DRIVE AND 98TH ST., NEW YORK. (See Plans page 29).

Wm. L. Rouse, Architect.





COMPETITIVE BIDDING.

THE New York *Sun* is famous for its discussions of all kinds of topics from the pie that mother used to make to industrial problems, and recently various correspondents expressed their views on the editorial page as to the difficulties of securing honest workmanship in the modern building. This discussion came from all sides, but the consensus of opinion seemed to be that the poor work which most of the correspondents complained of was due to the rush with which our buildings were constructed, which, in turn, could be laid at the door of competitive bids. It was, therefore, very interesting to find that the report made by the Standing Committee on uniform contracts and specifications at the recent convention of the American Institute of Architects, reached exactly the same conclusion. This report criticized at length the evil results coming from our existing system and summed up its criticisms of this system in the following arraignment:

The time consumed and the expense incurred by contractors for estimating add materially to the cost of every building; wastes the time of contractors and architects, and detracts considerably from the amount of personal supervision of the work by the contractors.

Competitive bidding does not, as a rule, make it possible to give the work to the man most capable of doing it.

Competitive bidding does not necessarily establish a true and proper basis on which to make the contract.

As to the time and expense involved by competitive bidding and the effect on the amount of personal supervision given the work by the contractor, the Committee has secured the statements of five representative contractors, of the amounts of time taken and expense incurred by each for one year in making competitive bids. The cost of building estimated would average from \$100,000 to \$150,000. While the amounts and quantities in these statements could not, perhaps, be universally applied, they do provide a basis for some deductions that are most valuable and impressive in this connection.

The statements from the contractors show that:

The average number of jobs estimated by each contractor for the year was seventy-two, and the average number of contracts obtained ten. The cost of the average amount of time spent by the office force of each firm on each job was \$125. The average expense on each job incurred, in addition to this, by the estimating of the numerous sub-contractors and material men, was \$378, making a total of \$503 as the expense involved by each contractor, his sub-contractors and material men. The amount of time spent by the head

of each firm in estimating or overseeing the work of estimating on each job averaged twenty-one per cent. of the total time given to his business.

From these statements it appears that the average cost of each estimate is \$503, not including the value of the time spent by the head of the firms. As there are usually at least six bids taken for each building the cost for the bids would be \$3,018, or from two to three per cent. of the cost of the building.

Each contractor estimated seventy-two buildings in one year; the total number of bids given by the five contractors was 361 at \$503 each, which includes the sub-contracts and material men's expense, making a total of \$180,583. Deducting one-third of this for sub-contractors' bids, used in common by the general contractors leaves, approximately, \$120,000.

As only ten jobs were secured by each, or fifty for all, the expense of the bids from which work was secured was \$25,150; while the expense incurred for estimating the other jobs which they did not get was the difference between \$25,000 and \$120,000, which is \$95,000. This sum is a dead loss to the five contractors, their sub-contractors and material men in one year. As some one must make up the loss to them, it is of course charged on the books as estimating and office expense, and the owners from whom they secure building contracts must pay for it. It is perhaps only fair to these contractors to state that their expenses for estimating are probably as small as they could consistently be made, as their offices are well organized and the work of estimating is economically and systematically done.

The cost of estimating mounts up to an astonishing figure in some ways, especially

if one considers the amount so involved as compared with the total value of work done in some of the large cities.

The cost of the building for which permits were taken out in Chicago for 1906 was \$63,000,000, which means, according to the contractors' statements, at least \$1,260,000 for estimating. According to the percentage fixed by the contractors' statements, only \$210,000 of this expense resulted in securing work for those who estimated, while the amount which must be charged over on the books as the cost of time spent, which produced nothing, reaches the enormous sum of \$1,050,000, and all of this in one city. For the entire country the sum must have been an amount so large that it hardly seems possible that we should have continued for so many years a practice so costly and at the same time so full of defects as competitive bidding.



Architects of To-Day.

MR. WM. L. ROUSE, NEW YORK.

Further on, the committee came to the same conclusion as the correspondents in the *Sun*, that most of the bad workmanship in our modern buildings was due to the fact that the contractors' interests were not the client's interests, and that he, in turn, was compelled to insist that his workmen perform their labor with all possible speed irrespective of any other conditions. As a cure for the evils, the committee, of which Mr. George C. Nimmons is chairman, proposed the following radical departure, embodying in a measure the system of quantity surveying, as practiced in Great Britain:

"After completing the plans and specifications, the architect or owner would commission an independent estimator to make a complete estimate of all labor and material in the proposed building. If the cost were found satisfactory, the architect would go over the estimate for the owner, and a contractor best suited for the work would be selected and given the estimate and plans to check over, with reference to making a contract. If the contractor found the amount of the estimate satisfactory, he would sign a contract, made with the owner, to construct the building for that amount, plus a fee for his profit. A scale of fees for various buildings would be determined by an approved schedule of fees.

"At the completion of the work, if the building cost less than the amount of the estimate, the amount he saved would be divided equally between the contractor and owner, and if the cost of the building ran over the amount of the estimate, the loss would be divided equally. In this way the owner's and contractor's interests would be the same; whatever would be for the contractor's gain and profit would also benefit the owner in the same manner, and their relations thereby would be ideal, although they would be just the opposite from what they are now.

"If it were thought that this method of making a contract would be too radical a change to make at this time, an effort might be made to see what could be done in the way of doing away with competitive bidding and to sub-

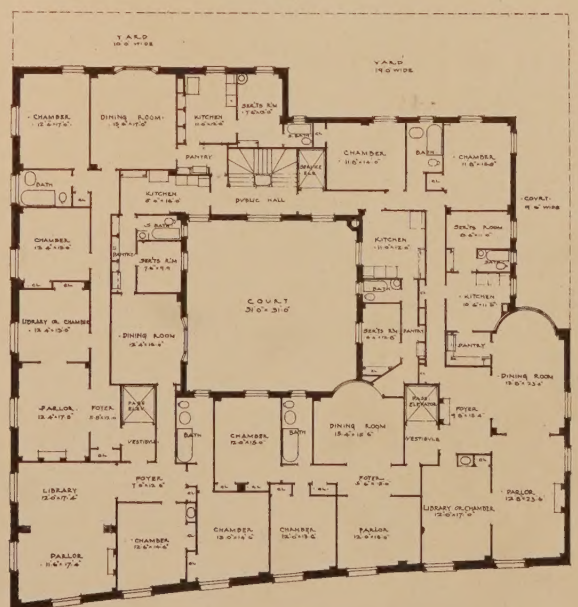
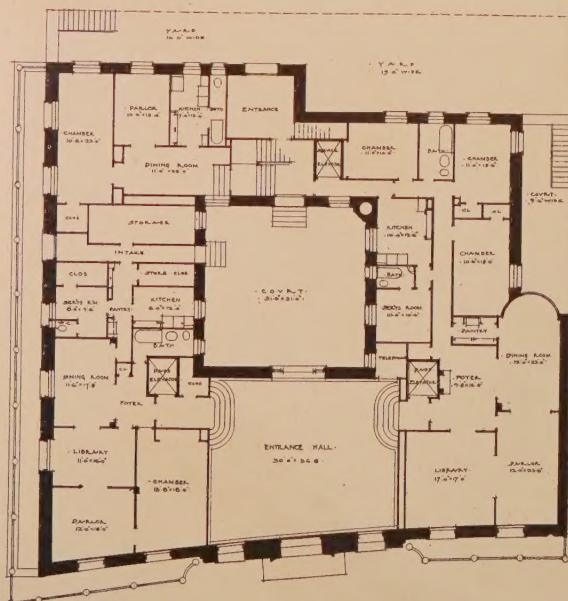
stitute in lieu thereof the independent estimator's figures. If this could be done, contracts the same as we have now could at first be let on a basis of the independent estimator's cost of the building, which would be a great improvement over using competitive bids as a basis as we do now."

ROUGH TESTING.

IT is the experience of everyone that has had charge of building operations that it is sometimes necessary to apply tests to materials, and to form a judgment as to their suitability to their purpose or otherwise, at a moment's notice, condemning or approving as the case may be. Many of us rely upon experience only; but when time permits, all careful men prefer to use some test or other, however rough it may be, without resorting to elaborate calculations, or submitting samples to elaborate scientific tests involving the use of heavy machinery, and occupying much time. We all know the tale of the builder who saw one of his workmen sitting on a piece of timber which did not look to be strong enough to bear him, and who, instead of telling the man to get down at once, went off to his textbooks to consult them as to what weight the joist would safely carry, to find when he came back that the man had fallen and broken his arm. This may be nothing more than a tale, but it illustrates our meaning of the necessity of being prepared to pass reliable judgments without much ado.

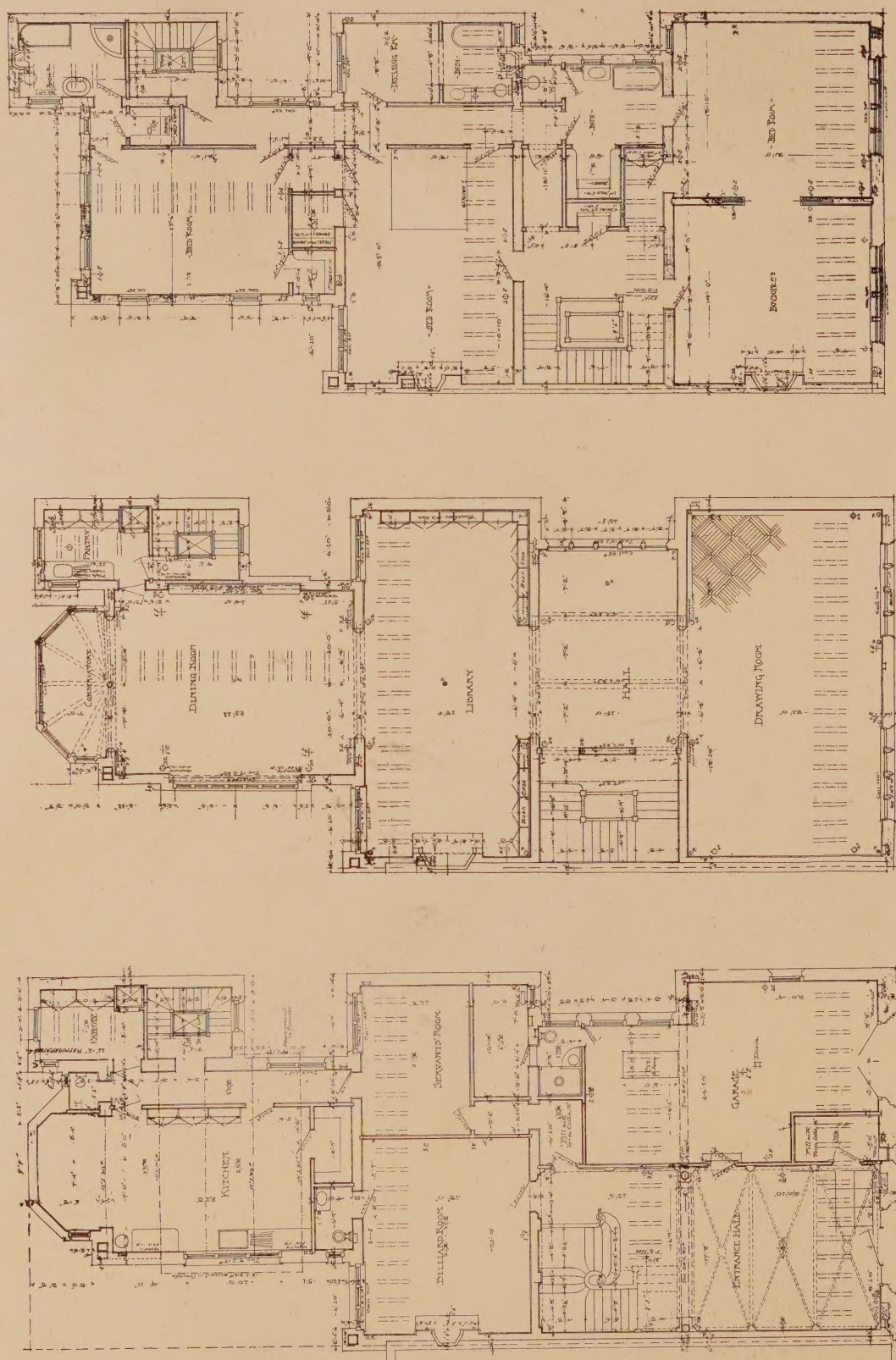
The things actually required for rough testing are exceedingly simple and few, consisting of water, a hammer, a saucepan and a little bottle of sulphuric acid. Equipped with these and common-sense, combined with a knowledge of the defects to which building materials are liable, it should be possible to do all that is necessary, generally at once, but in any case in the course of a few hours. Stones, for instance, ought always to be tested by tapping them over, either with a hard pebble or light hammer, in order to ascertain if they

(Continued page 31)



PLANS, PETER STUYVESANT APARTMENTS, NEW YORK.

Wm. L. Rouse, Architect.



PLANS, RESIDENCE, STEPHEN H. BROWN, 154 EAST 70TH ST., NEW YORK (See Plate XVII).

Edw. Pearce Casey, Architect.

(Continued from page 29)

have any vents or sand-holes, whose presence is detected by a dull sound, which is unmistakable when it has once been heard in contrast with the metallic ring of a smart blow on sound stone. This applies to stones of almost all descriptions, although it may be noted that softly-compacted sandstones or oölitic limestones will sometimes emit a dull ring. This does not indicate local faults, but a general weak structure, and should always be taken as an indication that the stone in question should be viewed with suspicion. If it be placed in water it will, in all probability, be found to absorb a large amount, owing to its loose and spongy character; it is probably liable to disintegration, and to the penetration of moisture. There are other easily-applied tests for stones, such as immersion of small, freshly-cut chippings in a glass of water, in which they should be left for half an hour, and then vigorously stirred, when, if they are loosely compacted or contain any appreciable amount of clayey substance, the water will turn muddy. It is not a test, however, which is often employed, and practical men are more inclined to rely upon a thorough inspection by tapping than anything else.

In the case of slates, the immersion test is best replaced by standing them upright in a bucketful of water for about ten minutes, and then observing the state of the edge. If the slate be a soft one and unreliable, the water will be seen to have crept up along the layers of cleavage to any extent from one to three inches in that time above the general level, and without showing on face; while if the slate be sound, there will be no appreciable rise. A bad slate, too, will, when wet, smell distinctly earthy, as if the clay of which it is composed had never been really compacted into slate in nature's laboratory.

Bricks should be tested much in the same way as stone, it being possible to detect weak and faulty samples immediately by tapping them. The labor of tapping each one, however, is much too great for most people to indulge in, and it is possible to judge with tolerate accuracy the state of a whole batch by tapping a few; the testing of each one being needed under a stringent specification, and in places where the very best work is required. Of course, badly cracked bricks can be detected by inspection, which is also the means of discovering whether the color is uniform, and that which is required, and whether the arrises are properly sharp. Even soft hand-made rubber bricks will ring when struck if they have been properly made and burnt, and this is really the only test of their power to resist the atmosphere after the outer skin has been removed by rubbing or carving. The absorption tests, although generally advocated in text-books, is not always to be relied upon in the case of bricks, as the amount of the water taken up varies greatly according to the class of brick which is used. A hard-pressed and machine-made brick, for instance, made of a heavy clay, absorbs very little much less than even the most perfect rubber.

If there be any question as to the amount of sand contained in a particular sample of mortar, the only thing to do is to treat a little with acid; and this is a test which cannot be accomplished quite at a moment's notice. In the first place, a little mortar has to be carefully dried in a saucer over a fire or gas flame. It must then be weighed, the easiest way of doing this being to weigh it saucer and all, but with great accuracy. The next thing to do is to pour some sulphuric acid over it, when the lime will dissolve into the acid, except what escapes as carbonate acid gas. It does not do to try too much mortar at a time, as very marked effervescence takes

place when the acid and lime meet, and there is risk of a good deal being lost by overflowing the saucer. As soon as the effervescence subsides, the contents of the saucer should be carefully scraped out on to a filter of clean blotting-paper, when the residue, after drying, can be re-weighed and the saucer also weighed; it is then easy to find out what proportion by weight the sand bore to the lime. This does not correspond quite with the proportion by bulk, which is that by which mixing is done, and the difference must be borne in mind in approving or condemning any particular sample. The residue generally discloses by inspection whether sand alone has been used, or whether some other material, such as garden mold, has been mixed with it, in order to make it work more easily under the trowel, and save a small amount of money to the builder.

So far as sand is concerned, it can generally be tested quite sufficiently, when in bulk, by rubbing a little between the fingers, which anyone who is accustomed to building operations will do almost as a matter of course, and without thinking, when he sees a heap. It should feel sharp and gritty, and be rather coarse in texture, and leave no stain upon the hands even if they happen to be clean, which is not often the case when this sort of thing is done. A soft-feeling sand of very fine grain may be easy for the bricklayer to work with, but it does not make good mortar. It is always well, too, to just put the tongue to a small sample, in order to detect whether it contains any salt, in which case washing in running water is imperative; though preferably such sand should be rejected altogether. Salt sand is not only found near the seacoast or on the shore, where, of course, a builder likes to find it, as he can pick it up for nothing, but is even occasionally met with in a sandpit where it represents an old sea beach. It may be used without any serious consequences other than discoloration in garden walls, but its habit of attracting moisture makes it highly undesirable for the walls of houses.

Cement, if it bear a good maker's guarantee, can almost always be relied upon, unless it has been exposed to the atmosphere during damp weather, when it may have become inert by air cooling. This is easily ascertained by plunging the hand into it, when it will strike cold. Anything made of a dead cement like this will be useless, as it possesses no more adhesion than so much sand. If a cement be suspected on other grounds than this, there is one infallible test of its soundness, which takes about a day to apply, and is much more reliable than anything else short of submitting it to analytic and machine tensile tests, which occupy a long period. This is the boiling test. A small pat, about half an inch thick, is laid upon a piece of glass sufficiently small to go into the saucepan already referred to as a necessity. The pat may taper away to the edges, and the piece of glass need be no larger than the cover-glass to a lantern slide, or if this be not available, a fragment of slate some three or four inches square will do. The pat is best made in the evening and left for the night to set. In the morning it can be put into a saucepan full of water, brought to the boil, and kept gently simmering for some six hours, further water being added from time to time as it evaporates. Long before this period has elapsed, however, the cement will have turned to soup unless it is a good sample. If it has slightly cooled, the pat may curl up at the edges and come away from the glass; but a thoroughly good sample will remain adherent to it, and be in as sound a state as when it was put into the saucepan.

Timber can generally be accepted or rejected on in-

spection. Nothing else will show whether it contains more than a fair proportion of sapwood, or whether it is "doaty," or, in other words, subject to a disease like measles, which indicates incipient dry rot. It is similarly by inspection only that one can see if there be waney edges or shakes. On the other hand, a lengthy piece can be best tested by sound for the presence of any hidden defect, by getting someone else to tap one end while you listen at the other. The sound should be heard with perfect distinctness, even the ticking of a watch being discernible through a log forty feet long, if it be thoroughly sound and well seasoned.

Speaking generally, structural metal work should be subjected to more severe tests than can be applied without heavy testing machinery, but all the same a certain amount can be done. Cast-iron work should be tapped with a light hammer gently all over, in order to discover any hidden bubbles by means of sound; while steelwork can occasionally be tested by bending, though it is a test which hardly ought to be applied unless it has been specified, and the degree of bending stated to which samples may be taken under certain conditions. It is different with lead, for the principal defect to be looked for is an insufficiency of weight. It is even said that say, five lb. lead can be supplied either "light" or "heavy," as may be ordered, and the "light," of course, weighs less than five lb. per square foot, and ought to be refused. Thickness gauges are to be obtained for testing this; but the differences are so slight that they are not to be relied upon so completely as the actual weighing of a sample square foot cut from bulk. It is possible to use a scrap of smaller size for weighing, but in spite of the waste incurred it is much better, if there be any suspicion, to cut an exact square foot out of a sheet than to trust the smaller piece, whose exact area and weight it may not be easy to determine.

THE Hydrex Felt & Engineering Co., Engineers and Experts in Waterproofing Problems and Manufacturers of the well-known "Hydrex" waterproofing products, will hereafter be represented in Mexico by Ernst O. Heinsdorf, Apartado No. 939, Avenida del 5 de Mayo 23, Mexico City. Mr. Heinsdorf will carry a complete stock of the "Hydrex" products in his Vera Cruz warehouse to enable him to supply on immediate notice, the increasing demands for those materials in that country.

MR. JOHN H. BOLL, formerly of the firm of Boll & Taylor, of Cincinnati, has opened an office at 487 New Britain Avenue, Hartford, Conn. He will be pleased to receive manufacturers' catalogs.

IN January *Architecture* the Cambridgeport Savings Bank was credited to C. H. Blackall, architect. W. E. Chamberlin and C. H. Blackall were associated architects on the building.

BOOK REVIEWS.

SOME NOTABLE ALTARS. Rev. John Wright, D.D., L.L.D. 1908. The Macmillan Company, New York. Cloth. \$6.00 net.

The work is confined to altars in the Church of England and the American Episcopal Church. The subjects are selected for striking appearance, excellency of treatment or because they are the special work of well-known architects or builders. The illustrations comprise one hundred and fourteen full page plates. Notes and descriptive matter regarding same have been furnished by Rectors, Vicars, architects and builders. This is a valuable book of reference for architects interested in church decoration and design.



A Tin Roof in Good Condition After 72 Years

The tin roof on the old wing of the Young Ladies' Seminary at Bethlehem, Pa., has been there for seventy-two years. Thirty-one years ago the gravel roof on the old wing was blown off and replaced by a tin roof. Both roofs are in first-class condition today.

This instance of the durability of good tin, and incidentally, the superiority of tin over gravel, shows what may be expected of "Target-and-Arrow Old Style" tin, which is still the tin of 72 years ago.

The subject of roofs and roofing material is quite fully gone into in our booklet, "A Guide to Good Roofs." We mail it free on request.

See pages 407 to 409, in Sweet's Index.

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